GIT

Write down digestion of CHO. Mention Sites and Enzyme involving:

Digestion is a process in which large molecule Break down into smaller molecule.

Major Source of CHO are Starch which is polysacchride and Sucrose and lactose which is Disacchrides.

Digestion in mouth:

Salivary Alpha amylase (Ptylin) Cleave α-1,4 linkage of Starch and Convert it into Dextrins.

Digestion in intestine:

Pancreatic Alpha amylase Cleave α-1,4 Linkage of Dextrin and Convert it into Maltose & Maltotrios

Digestion in intestinal Epithelial cell:

lactose $\xrightarrow{\text{Lactase}}$ Glucose + Galactose

Sucrose $\xrightarrow{\text{Sucrase}}$ Glucose + Fructose

➡ α-Dextrinase Cleave α-1,6 Linkage of Dextrin and release Glucose molecule.

➡ Maltase Cleave α-1,4 linkage of Maltose & releasing ② molecule of Glucose.

it also Cleave the α1-4 Linkage of oligosacchride and release Glucose molecule.

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Give brief account on absorption of CHO & what is process is involved:

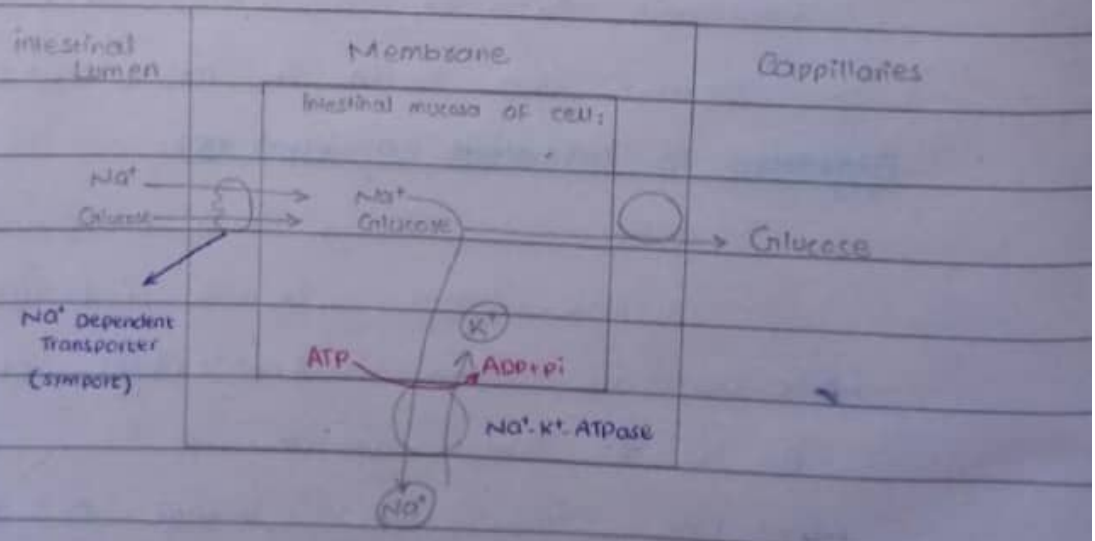
Glucose is absorbed From intestinal lumen to intestinal Epithelial cell by two type of Transport.

Na^+ Dependent Transport: So active transport By

Glucose and galactose are transported along Na^+ From lumen to intestinal Epithelial cell. The driving Force is maintained by low intracellular Na^+ level by Na^+-K^+-ATP

Na^+ independent Transport:

Glucose and Galactose are transported From lumen by the help of Glucose Transported 5 Glut 5



Enumerate Pancreatic Enzyme with their Functions:

It is clear, Colorless, watery Solution

Gl's PH 8.0 – 8.3

98.5 % H_2O

1.5 % Solid constituents → organic form → Enzyme in Zymogen Form.

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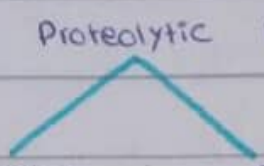
Digestion in Intestine: include Bicarbonate & Proteolytic enzyme

HCO_3^- neutralizes the Stomach acid and raise PH of intestinal Content.



Endopeptidase	Exopeptidases
Cleave central peptide linkage of Protein chain.	Cleave one amino acid at time of from Carboxyl end of peptide.
Example: Trypsin, chymotrypsin	Example: Carboxypolypeptidase.

Enzymes of intestinal Epithelial cell:

Dipeptidases / Tripeptidases: Cleave dipeptide and Tripeptide and release amino acid.

Exopeptidases: Break one amino acid at time from Carboxyl end of peptide. e.g Carboxypolypeptidase.

Causes, Consequences and treatment of lactose intolerance:

It is due to Deficiency of Lactase (B-Galactosidase)

Symptoms: ① Diarrhea
② vomiting
③ Abdominal cramp
④ Bloating

Treatment: Avoid milk / dairy product and add lactase pills to diet.

Person Cannot digest dairy products.

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Trypsin: It is secreted in zymogen form i.e Trypsinogen which is activated by enterokinase and later by Trypsin itself

It is Endopeptidase i.e Hydrolyze central peptide bond

It is involve in Blood Clotting.

Chymotrypsin: It is secreted in inactive form i.e Chymotrypsinogen.

It is Endopeptidases i.e Hydrolyze central peptide bond.

Elastase: It Hydrolyze the Elastin

Collagenase: It Hydrolyze Collagen.

Ribonuclease: It Hydrolyze RNA.

Deoxyribonuclease: It Hydrolyze DNA.

Phospholipase A_2: It Hydrolyze Cephlin & lecithin

Pancreatic lipase: Hydrolyze Triglycerides.

It act only in the presence of Bile salt

Pancreatic Amylase:

Salivary amylase Convert Starch, Glycogen & Dextrin into Maltose.

Carboxypolypeptidase: Exopeptidase i.e Hydrolyze Terminal Peptid bond

Describe Digestion of Protein:

Digestion of protein Take place in Stomach & Small intestine

Digestion in Stomach: Pepsin is secreted by Chief cell and break protein large polypeptide into smaller polypeptide.

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Absorption of Amino Acids :

Amino acid absorbed from intestine into Blood by intestinal Epithelial cells by Two different type of protein Transporter mechanism.

Na-Amino acid carrier system :

A transport protein which require Na-K ATPase activity, transport Na^+ ions and amino acid.

1) Neutral amino acid carrier
2) Phenylalanine and Methionine Carrier
3) Specific carrier for Imino acid

Gramma-Glutamyl cycle: (Messeter cycle)

Amino Acid are transported across cell membrane attached to Glutamate and released into cytoplasm. It is Glutathione dependent process.

Digestion of Fat :

- Major dietry lipid is Triacylglycerol (TAG)
- Digestion take place in Small intestine and require Bile salts & Pancreatic enzyme.
- Pancreatic Lipase along with Colipase Convert TAG into 2-monoacylglycerol & Free Fatty acid, which packed into micelles.

Micelles :- Microdroplet of Fat, emulsified by bile sa which also contain @ Cholestrol
@ Fat-soluble vitamins.

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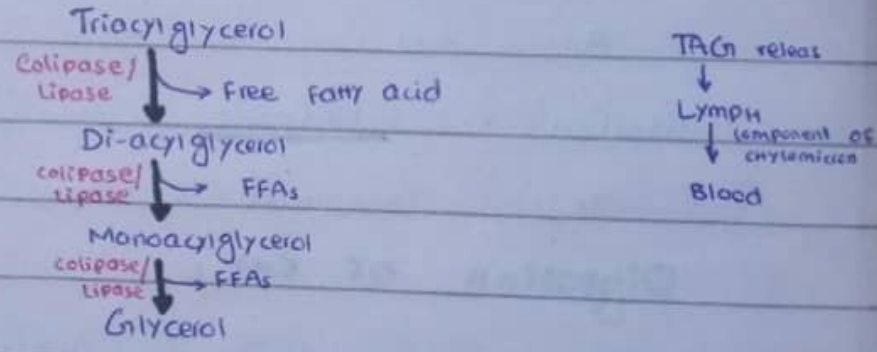
Absorption of Fat :

Micelles get attached to microvilli of intestinal Epithelial Cells which absorb 2-monoacylglycerol, FFAs, Cholestrol, and Fat – soluble vitamins.

Emulsification of Fat: Emulsification is a process in which there is break downing of large Fat globules into tiny droplets providing Decrease surface Tension and increase / Large Surface area on which Pancreatic Lipase Can act.

Emulsification Assisted by Bile salt.

Action of Lipase on TAGs:



Write a note on Cholelithasis :

Cholelithasis refers to Presence of Gall Stones/ it refers to a Disease Caused by Gall stones.

- 80 % People have no symptoms
- Crampy pain in right upper Abdomen
- Normal ratio of Cholestrol to bile salt is 1:20 to 1:30. Gall stone occur when ratio of Cholestrol to Bile is ↑.

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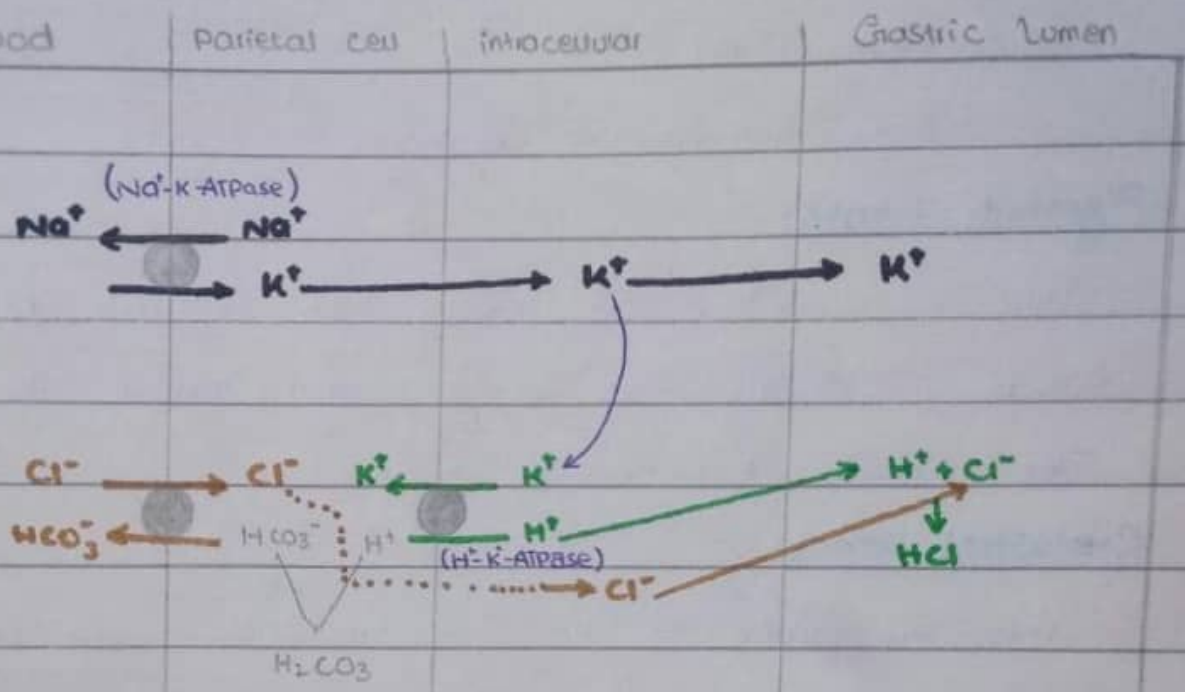
Mechanism of HCl Formation:

How



How Gastric mucosa Prevented by auto digestion:

Mucus: A Glycoprotein present in mucus give rise to Gel like Layer about 0.2 mm thick that Cover Gastric mucosa.

HCO_3^-: The HCO_3^- Produce by Surface mucosa cell that butter HCl.

Trifoil peptide:

The mucos have special peptide caued Trifoil peptide that are acid resistance.

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TYPES:

Cholestrol Stones 80%.

Pigment Stones 19%.

Mixed Stones

Stone with Calcium Content

Pigment Stones:

They are small, dark colour. They are made up of Billirubin, Ca^{2+} salt and 20% Cholestrol found in Bile, By excessive breakdowning of RBC.

Cholestrol Stones:

They are made up by yellowish colour, with dark Spot in Center. Most Common type 80% Cholestrol by weight.

Mixed Stone: They are made up of Cholestrol and salt. They are also very Common.

Causes:

1) Bile Containing high Content of Cholestrol / Billirubin
2) InComplete emptying of Gall bladder.
3) low Fiber diet
4) Obesity
5) Produce Surfactant.

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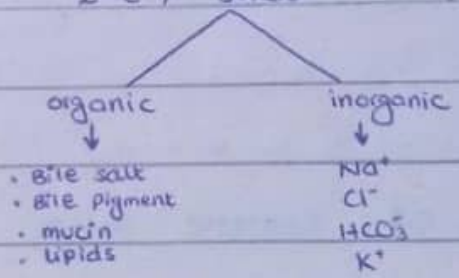
Write down Composition, Synthesis site and Function of Bile?

Synthesis site: It is secretion & Excretion of Liver

Secreted Continuously by Liver Parenchymal cell and Stored in Gall bladder.

Composition: 97.4 % H_2O

2.6 % solids



Function:

1) Emulsification
2) Stabilize EMulsion
3) Provide Alkaline medium
4) Strong choleretic agent
5) Produce Surfactant

Hartnup Disease: It is Characterized by the Renal Epithelial cell to absorb Neutral amino acid.

Tryptophan absorption affected

Symptoms

Pallegra

Syndrome:

Cistinuria

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Enumerate Function of Sliva:

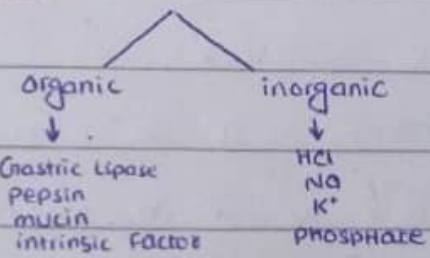
1) lubrication & Moistening
2) Digestive Action
3) Cleansing Action
4) Antibacterial Action
5) Secretory function
6) Excretory function
7) Stimulating Effect
8) Antioxident & protection

Composition of Gastric juice with Enzyme and Fun

It is secreted by 3 type of cell.

1) Chief cell → Pepsinogen
2) Parietal / oxyntic cell → HCl
3) mucous cell → Secrete mucin.

Composition:



Functions:

1) pepsin → Endopeptidases (Cleave central peptide bond)
2) Gastric lipase → break short or branch FATty acid
3) HCl → Antimicrobial Activity, maintain PH of Gastric juice
4) Intrinsic factor → required for Absorption of vit. B12
5) Mucin → lubricating Agent.

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Steatorrhea : loss of lipids or excessive excretio

of Fat in feces is known as steatorrhea.

Causes:

Deficiency of Bile

Deficiency of Pancreatic Enzyme

Defect in absorptive cells of intestine.

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